REMARKS/ARGUMENTS

Claims 7-33 are pending in this application. By this Amendment, Applicant amends Claim 7 and adds Claims 16-33.

Claims 7-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamura et al. (US 2003/0107300) in view of Mizusawa (U.S. 6,778,029). Applicant respectfully traverses the rejection of Claims 7-15.

Claim 7 has been amended to recite:

> A piezoelectric electroacoustic transducer comprising:
> **a substantially square piezoelectric diaphragm** arranged to be vibrated in a thickness direction of the diaphragm by applying an alternating signal to lead electrodes thereof;
> a casing including a supporting portion disposed on an inner circumference of the casing, the supporting portion supporting an outer circumference of said piezoelectric diaphragm;
> first and second terminals that are fixed to said casing so that inner connecting portions are exposed on said inner circumference of the casing; and
> conductive adhesives electrically connecting the lead electrodes of the piezoelectric diaphragm and the inner connecting portions of the first and second terminals; wherein
> one of said conductive adhesives is arranged between the inner connecting portion of said first terminal and one of the lead electrodes near one corner of said piezoelectric diaphragm;
> the other conductive adhesive is arranged between the inner connecting portion of said second terminal and the other lead electrode near another corner of said piezoelectric diaphragm which is adjacent to the one corner of said piezoelectric diaphragm;
> **the one corner and the another corner of the piezoelectric diaphragm are disposed at opposite ends of one side of the piezoelectric diaphragm**; and
> **the piezoelectric diaphragm and the conductive adhesives are arranged such that the displacement of vibrations of the piezoelectric diaphragm is circular**. (emphasis added)

The Examiner alleged that Nakamura et al. teaches all of the features recited in Applicant's Claim 7, except for the one corner and the other corner of the piezoelectric

diaphragm being at opposite ends of one side of the piezoelectric diaphragm. The Examiner further alleged, "Mizusawa teaches a piezoelectric transducer in which the corner and the another corner of the piezoelectric diaphragm are disposed at opposite ends of one side of the piezoelectric diaphragm." Thus, the Examiner concluded that it would have been obvious "to combine the terminal configuration of Mizusawa et al. with the piezoelectric electroacoustic transducer of Nakamura et al. for the benefit of simplifying the means of connection to the piezoelectric diaphragm by allowing all of the connections to be made at the same end of the device."

In addition, in the Response to Arguments section on page 6 of the outstanding Office Action, the Examiner further stated:

> However, both Nakamura et al. and Mizusawa are both directed to piezoelectric devices, in which a piezoelectric layer is situated between two electrodes with a signal applied between those electrodes to generate vibrations in the piezoelectric layer, and are therefore in the same field of endeavor.

Applicant respectfully disagrees.

To further distinguish the present claimed invention over the combination of Nakamura et al. and Mizusawa, Applicant's Claim 7 has been amended to recite the features of "a substantially square piezoelectric diaphragm" and "the piezoelectric diaphragm and the conductive adhesives are arranged such that the displacement of vibrations of the piezoelectric diaphragm is circular." Support for these features is found, for example, in paragraphs [0044] and [0069] of the Substitute Specification.

New Claims 16 and 25 recite some features that are similar to the features recited in Applicant's Claim 7, and additionally recite the features of "the casing includes four support portions arranged at four inner corners of the casing" and "four corners of the diaphragm are supported by the four support portions casing." Support for these features is found, for example, in paragraph [0046] of the Substitute Specification.

With respect to the feature of "the diaphragm and the conductive adhesives are

arranged such that the displacement of vibrations of the diaphragm is circular" recited in Applicant's Claim 7 and 16, neither Nakamura et al. nor Mizusawa teaches or suggests anything at all about the shape of the displacement of vibrations of a piezoelectric electroacoustic transducer. Thus, Nakamura et al. and Mizusawa certainly fail to teach or suggest that the shape of the displacement of vibrations could or should be circular.

As discussed in paragraph [0006] in the Background of the Invention of the present application, when the conductive adhesives are coated near two corners on a diagonal line of the piezoelectric diaphragm as in Nakamura et al., the constraining force on the diaphragm is large and the vibration nodes are close to the inside, i.e., the displacement of vibrations of the diaphragm is elliptical. Therefore, the wavelength of vibration is short and the resonant frequency is high in many cases. Thus, Nakamura et al. certainly fails to teach or suggest the feature of "the piezoelectric diaphragm and the conductive adhesives are arranged such that the displacement of vibrations of the piezoelectric diaphragm is circular" as recited in Applicant's Claims 7 and 16.

Due to the arrangement of the conductive adhesives 7 of Mizusawa, the crystal blank 2 of Mizusawa, which the Examiner alleged corresponds to the piezoelectric diaphragm recited in Applicant's Claim 7, would inherently generate a bending mode vibration which would clearly not produce a circular displacement of vibrations. Thus, Mizusawa certainly fails to teach or suggest the feature of "the piezoelectric diaphragm and the conductive adhesives are arranged such that the displacement of vibrations of the piezoelectric diaphragm is circular" as recited in Applicant's Claims 7 and 16.

In addition, the Examiner is reminded that "[i]n order to rely on a reference as a basis for rejection of an Applicant's invention, the reference must either be in the field of Applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." See In re Oetiker, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992) and MPEP § 2141.01(a). That is, the Examiner must rely upon analogous art to reject Applicant's claims.

The present invention is directed to a piezoelectric electroacoustic transducer for use as piezoelectric receivers and sounders, as recited in Applicant's Claim 7. In contrast, Mizusawa is directed to the field of surface mount crystal units for use as surface-mount crystal oscillators and filters. Thus, the present invention and Mizusawa are clearly in different fields of endeavor.

The present invention is directed to solving a problems of conductive adhesives causing a shift in the node of vibrations to the inside, a lowering of the resonant frequency of the diaphragm, and an increased change in the resonant frequency of the diaphragm as a result of temperature changes (see, for example, paragraph [0008] on page 3 of the Substitute Specification). In contrast, Mizusawa is directed to solving the problem of reducing an area necessary to mount the crystal unit on a wiring board (see, for example, col. 1, lines 7-10 of Mizusawa). Thus, the present invention and Mizusawa are clearly directed to solving different problems experienced with entirely different devices from two completely different fields of endeavor.

Therefore, Applicant respectfully submits that the present invention and Mizusawa are clearly in different fields of endeavor, and that the Examiner has improperly relied upon Mizusawa to reject Applicant's Claim 7.

As noted above, the Examiner alleged that both Nakamura et al. and Mizusawa are directed to piezoelectric devices, in which a piezoelectric layer is situated between two electrodes with a signal applied between the electrodes to generate vibrations in the piezoelectric layer, and are therefore in the same field of endeavor. Applicant respectfully disagrees.

According to the Examiner's allegation, virtually every piezoelectric device would be considered to be in the same field of endeavor because virtually every piezoelectric device includes a piezoelectric layer that is situated between two electrodes with a signal applied between the electrodes to generate vibrations in the piezoelectric layer. As the Examiner is surely aware, piezoelectric devices are used in a great many

different and diverse fields of endeavor, such as electric cigarette lighters, AC voltage multipliers, pickups for electric guitars, microphones, chemical and biological sensors, electronic drum pads, fuel injectors for internal combustion engines, atomic microscopes, inkjet printers, electronic stabilization systems for video cameras, etc. Using similar logic would lead to the conclusion that every electrical circuit is in the same field of endeavor because every electrical circuit includes circuit elements through which electricity is transmitted. Accordingly, Applicant respectfully submits that the Examiner's definition of the same field of endeavor is unreasonable, and that Mizusawa is clearly non-analogous art for the reasons described above.

Even assuming *arguendo* that Mizusawa was directed to analogous art, there would have been no proper motivation to combine the alleged teachings of Mizusawa with Nakamura et al.

The Examiner alleged that the motivation to combine Mizusawa with Nakamura et al. would have been "for the benefit of simplifying the means of connection to the piezoelectric diaphragm by allowing all of the connections to be made at the same end of the device." However, Mizusawa fails to teach or suggest that providing the terminals 17 along one side of the quartz crystal blank 2 would simplify the means of connection to the planar substrate 11, and the Examiner has failed to explain how or why allowing all of the connections to be made at the same end of the device would be easier than making the connections at the locations shown in Nakamura et al. Since, as shown in Fig. 1 of Nakamura et al., all four sides of the piezoelectric diaphragm 1 of Nakamura et al. are equally accessible for connection to the terminals 11a and 12a via the conductive adhesive 14a and 14b, it is entirely unclear how or in what manner the means of connection would be simplified if the connections were made at the same end of the device. Applicant respectfully requests that the Examiner clarify how and in what manner the means of connection would have been simplified.

As noted in the recent USPTO Guidelines Regarding Obviousness and the KSR

Decision, the Examiner is required to provide a clear, reasoned statement supporting and explaining the conclusion of obviousness. However, the Examiner has failed to provide any explanation, reason, or logical conclusion as to why it would have been desirable for one of ordinary skill in the art to modify the piezoelectric electroacoustic transducer of Nakamura et al. such that the conductive adhesives would have been on one side of said piezoelectric diaphragm and near the corners at both ends of the one side, as allegedly taught by Mizusawa.

Therefore, Applicant respectfully submits that one of ordinary skill in the art would clearly not have had any reason or motivation to combine the alleged teachings of Mizusawa with Nakamura et al. for the purpose of simplifying the means of connection to the piezoelectric diaphragm, or for any other reason. In fact, such a modification as alleged by the Examiner would provide absolutely no benefit whatsoever.

Accordingly, Applicant respectfully submits that Nakamura et al. and Mizusawa, applied alone or in combination, fail to teach or suggest the unique combination and arrangement of features recited in Applicant's Claims 7, 16, and 25.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Nakamura et al. in view of Mizusawa.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claims 7, 16, and 25 are allowable. Claims 10-15, 17-24, and 26-33 depend upon Claims 7, 16, and 25, and are therefore allowable for at least the reasons that Claims 7, 16, and 25 are allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

To the extent necessary, Applicant petitions the Commissioner for a Two-Month Extension of Time, extending to April 30, 2008, the period for response to the Office

Action dated November 30, 2007.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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